

5

CLAIMS

What is claimed is:

1. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with a sufficient amount of one or more rare earth ions selected from the group consisting of elements 64 – 69 to provide a polymer composition magnetic mass susceptibility of greater than  $20 \times 10^{-6}$  emu/g measured at 298°K.
2. The transparent, paramagnetic polymer composition of claim 1 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.
3. The transparent, paramagnetic polymer composition of claim 1 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
4. The transparent, paramagnetic polymer composition of claim 3 wherein the transparent, paramagnetic polymer composition additionally comprises a short-chain fatty acid of the formula  $R_1COOH$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
5. The transparent, paramagnetic polymer composition of claim 3 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
6. The transparent, paramagnetic polymer composition of claim 4 wherein the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.
7. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with one or more rare earth ions selected from the group consisting of elements 64 – 69, the amount of rare earth ions being greater than 9 weight percent based on the total weight of the transparent, paramagnetic polymer.
8. The transparent, paramagnetic polymer composition of claim 7 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.

- 5 9. The transparent, paramagnetic polymer composition of claim 7 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
10. The transparent, paramagnetic polymer composition of claim 9 wherein the transparent, paramagnetic polymer composition additionally comprises a
- 10 short-chain fatty acid of the formula  $R_1\text{COOH}$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
11. The transparent, paramagnetic polymer composition of claim 9 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
12. The transparent, paramagnetic polymer composition of claim 10 wherein
- 15 the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.
13. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with one or more rare earth ions selected from the group consisting of elements 66 – 67, the amount of rare
- 20 earth ions being greater than 5 weight percent based on the total weight of the transparent, paramagnetic polymer.
14. The transparent, paramagnetic polymer composition of claim 13 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.
- 25 15. The transparent, paramagnetic polymer composition of claim 13 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
16. The transparent, paramagnetic polymer composition of claim 15 wherein
- 30 the transparent, paramagnetic polymer composition additionally comprises a short-chain fatty acid of the formula  $R_1\text{COOH}$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
17. The transparent, paramagnetic polymer composition of claim 15 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
18. The transparent, paramagnetic polymer composition of claim 16 wherein
- 35 the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.